

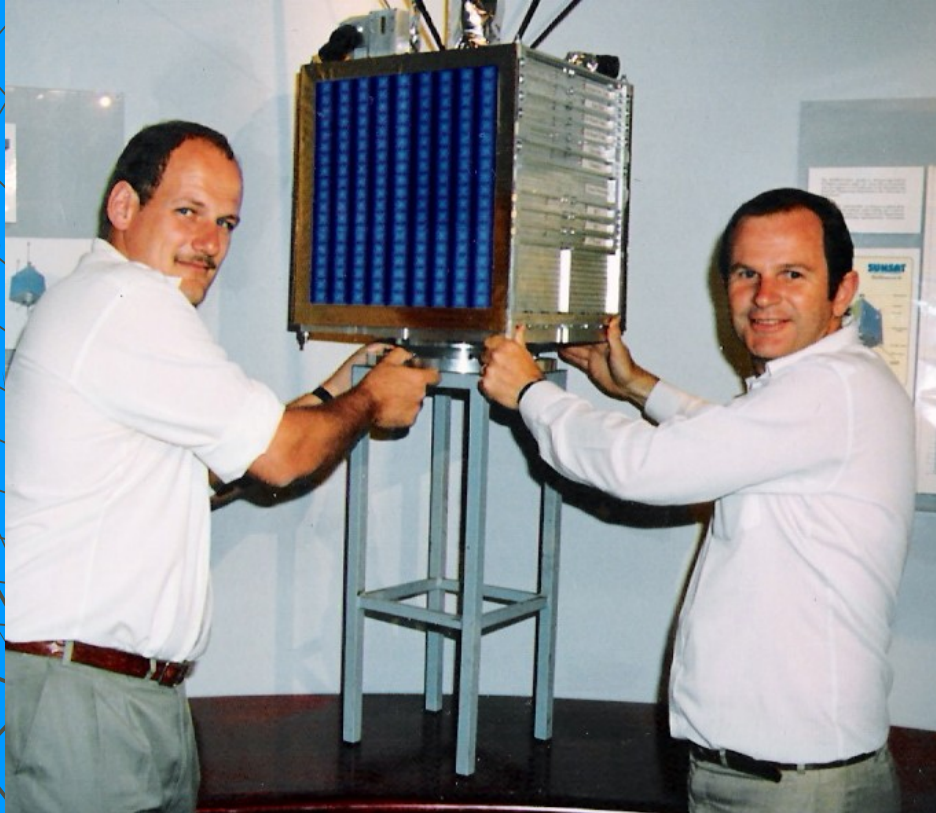
SUMBANDILASAT “Another SunSat”

2008 AMSAT-NA Symposium

AMSAT NA SPACE SYMPOSIUM



Take a step back

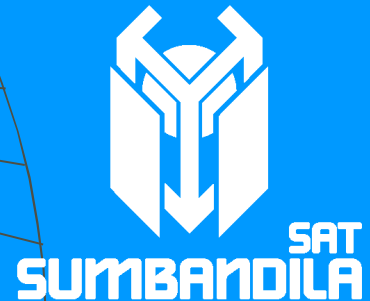


- ◆ Garth Milne pioneered SunSat OSCAR 35
- ◆ He paved the way for SumbandilaSat to carry an amateur radio payload
- ◆ He witnessed the construction but became a silent key before being able to experience the launch

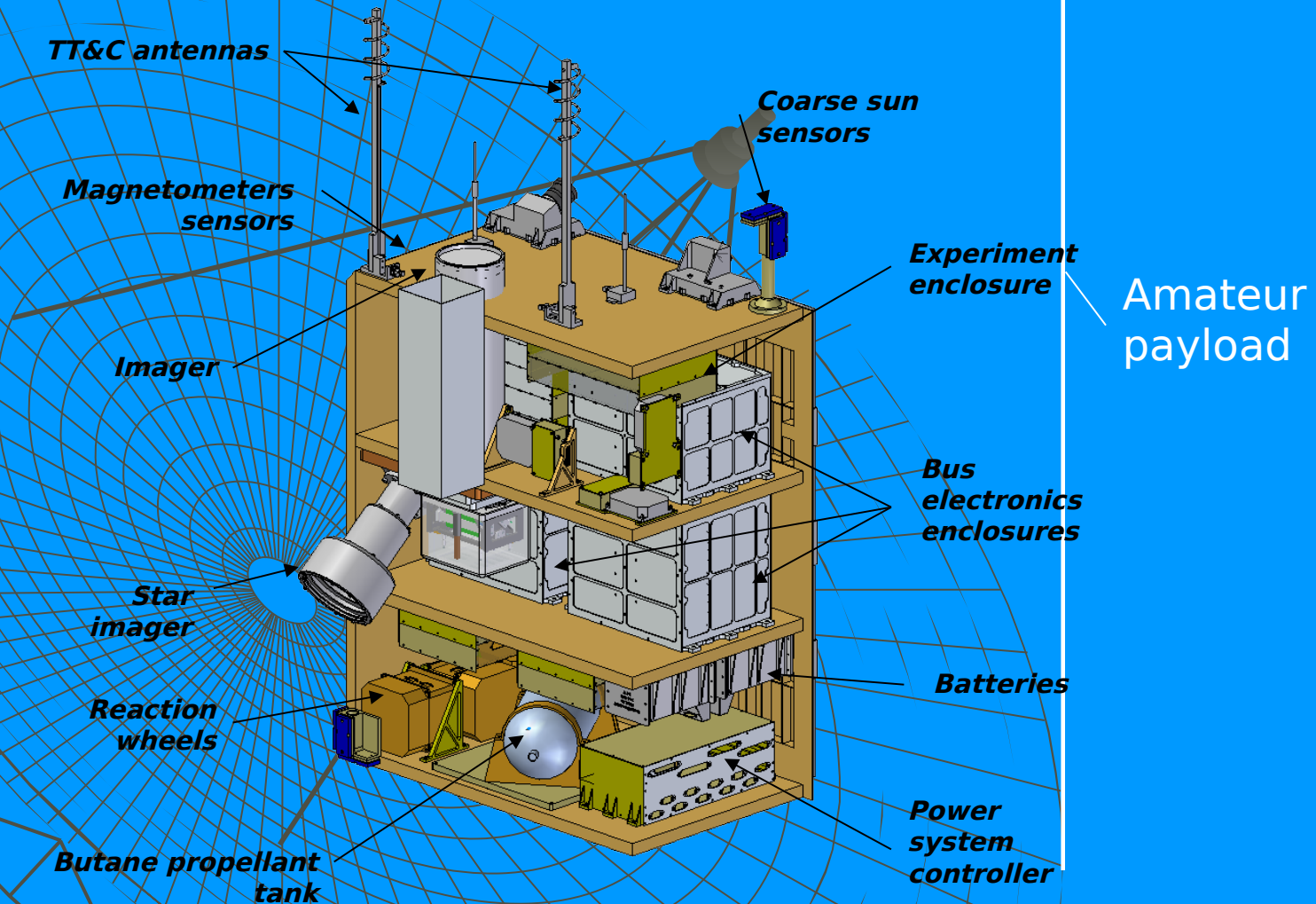
Sias Mostert and Garth Milne (right)

SumbandilaSat

- ◆ SumbandilaSat is a LEO satellite
- ◆ Its main payload is a remote sensing camera
- ◆ The other missions are the experimental payloads including amateur radio



Satellite Layout



Primary Payload

The main payload of Sumbandila Sat is a Multi-spectral imager which has a 6.25m Ground Sampling Distance (GSD) with 6 spectral bands and is supported by an on-board storage of 6 Gigabyte, with a redundant 18 Gigabyte spare.



SUMBANDILA EXPERIMENTAL PAYLOADS

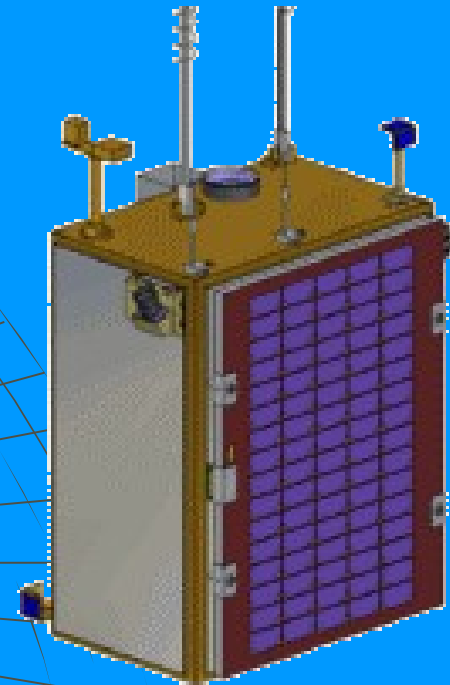
Experimental payloads

- ◆ **University of KwaZulu-Natal**
 - **Very low frequency radio waves**
- ◆ **Nelson Mandela Metro University**
 - **Forced vibrating string**
- ◆ **Stellenbosch University**
 - **Software defined radio**
 - **Radiation experiment**
- ◆ **SAAMSAT**
 - **Radio Amateur transponder**

SA AMSAT Payload

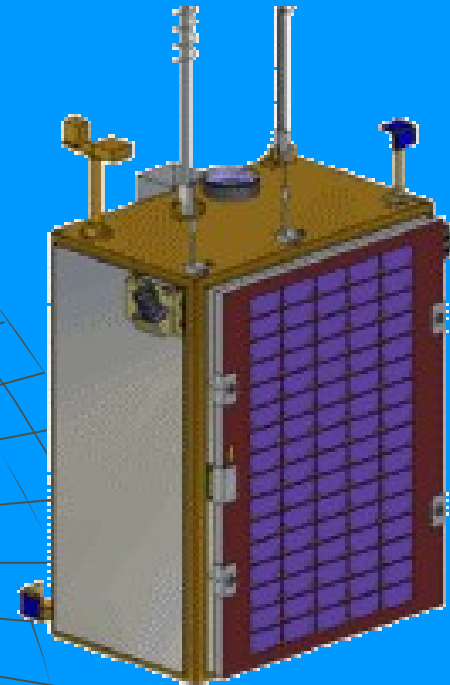
Objectives

- ◆ To promote an interest in SET amongst young people through their hands on involvement
- ◆ Create interest in satellite communication amongst the general amateur population

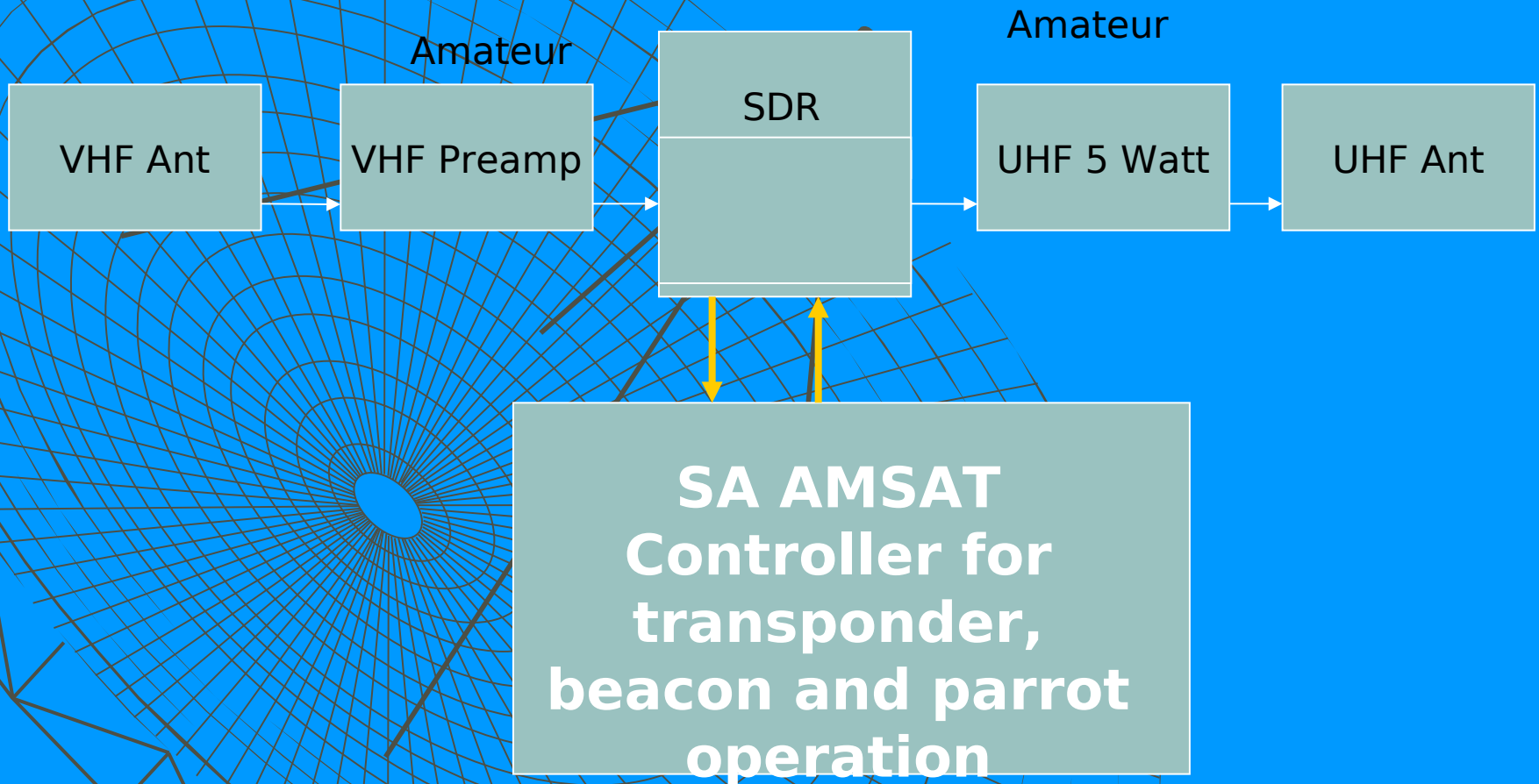


Payload Modes

- ◆ **Mode V/U FM transponder (the old mode J)**
 - 2m Uplink
 - 70cm Downlink
- ◆ **Parrot repeater**
 - 20 seconds of audio
- ◆ **Audio Beacon**

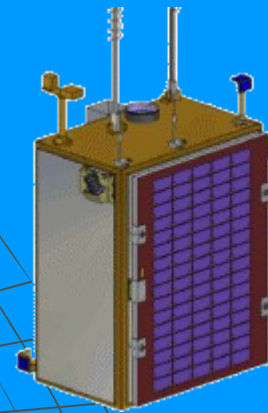


Systems



Operation

- ◆ On receipt of a “X” CTCSS tone the unit will command the satellite in the transponder mode
- ◆ On receipt of a “Y” CTCSS tone the control unit will command the satellite in the parrot mode
- ◆ If for a period no tones are received, the system will activate a voice beacon



Constructing Prototype

- ◆ Design: Andrew Roos ZS6AAA
- ◆ Prototyping: Hannes Coetzee ZS6BZP



Ground Station Requirements

- ◆ **A 2m/70cm 5 watt hand-held transceiver when the satellite is overhead**
- ◆ **For less ideal orbits an outside antenna such as ground planes or a two-band J-pole antenna is recommended.
Transceiver power 10 - 20 watts**
- ◆ **For the ultimate results a beam with azimuth and elevation control**

Frequencies

**Mode VU FM voice Transponder
and Parrot**

Uplink

145,880 MHz

Downlink

435,350 MHz

Ready in Clean room to go



Minister of Science and Technology and Hans van de Groenendaal
ZS6AKV

Launch Saga

- ◆ Launch was scheduled on a Sthil rocket from a Russian submarine
- ◆ Delays and internal politics in Russia caused the launch to be scrubbed
- ◆ After protracted bilateral negotiations the Russian have offered a Baikonur launch
- ◆ Time Frame:
December 2008 – March 2009

Way Forward

- ◆ The SumbandilaSat is under going final testing at SunSpace
- ◆ Codes to operate the payload will be published after successful launch and payload commissioning
- ◆ Operating schedule: mainly weekend

Visit www.amasatsa.org.za for updates